



## LP150U1 Liquid Crystal Display

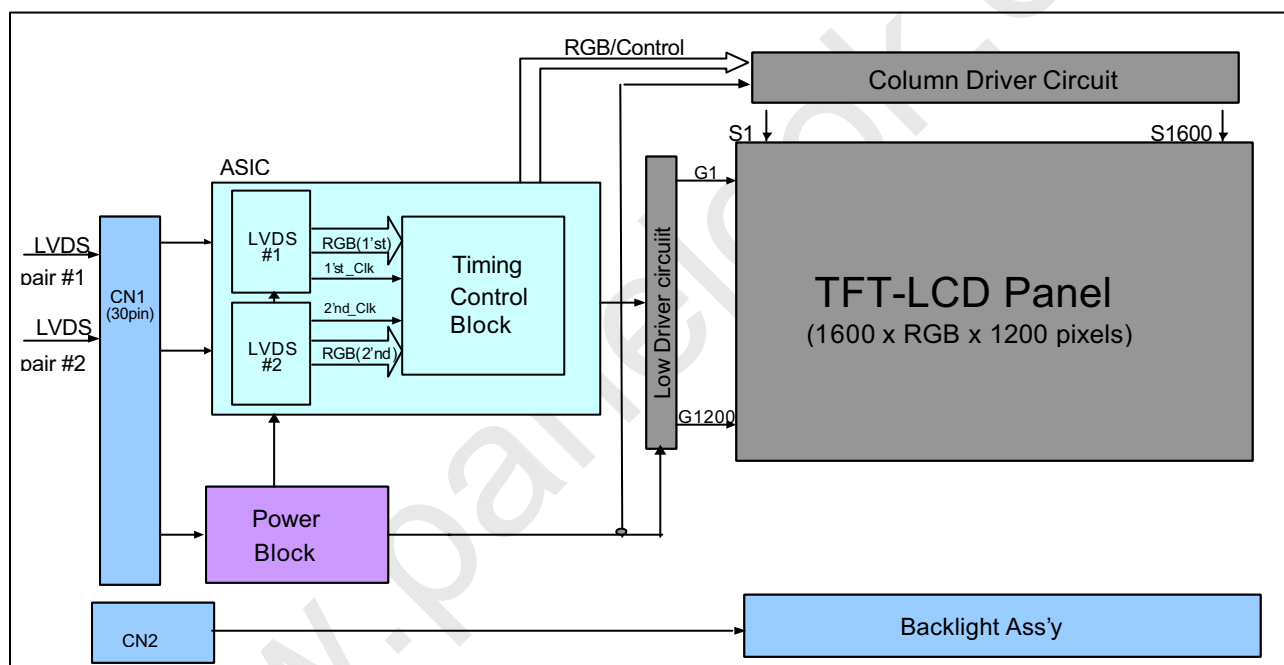
### Product Specification

#### 1. General Description

The LP150U1-A2 is a Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Lamp(CCFL) back light system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally white mode. This TFT-LCD has a 15.0 inch diagonally measured active display area with UXGA resolution(1200 vertical by 1600 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot, thus, presenting a palette of 262,144 colors.

The LP150U1-A2 has been designed to apply the interface method that enables low power, high speed low EMI. Flat Link must be used as a LVDS(Low Voltage Differential Signaling) chip.

The LP150U1-A2 is intended to support applications where thin thickness, low power are critical factors and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LP150U1-A2 characteristics provide an excellent flat panel display for office automation products such as Notebook PC.



#### General Features

Active screen size	15.0 inches(38.1cm) diagonal
Outline dimensions	318.5(H) X 241.5(V) X 7.0(D) mm (typ)
Pixel pitch	0.1905 mm X 0.1905 mm
Pixel format	1600 horiz. By 1200 vert. Pixels, RGB stripe arrangement
Color depth	6-bit, 262,144 colors
Luminance, White	150 cd/m <sup>2</sup> (typ)
Power Consumption	Total 7.0 Watt(typ)
Weight	670g (typ)
Display operating mode	transmissive mode, normally white
Surface treatments	hard coating(3H), anti-glare treatment of the front polarizer

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**Liquid Crystal Display****Product Specification****2. Electrical Specifications****2-1. Electrical Characteristics**

The LP150U1-A2 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the CCFL, is typically generated by an inverter. The inverter is an external unit to the LCD.

**Table 1 ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
MODULE:						
Power Supply Input Voltage	$V_{CC}$	3.0	3.3	3.6	Vdc	
Power Supply Input Current	$I_{CC}$		0.82		A	1
Power Consumption	$P_c$		2.7		Watts	1
LAMP						
Operating Voltage	$V_{BL}$		620		$V_{RMS}$	2
Operating Current	$I_{BL}$	3.0	6.0	7.0	mA	
Established Starting Voltage						3
at 25°C			-	1170	$V_{RMS}$	
at 0°C			-	1430	$V_{RMS}$	
Operating Frequency	$f_{BL}$		58		KHz	4
Discharge Stabilization Time	$T_s$			3	Minutes	5
Power Consumption	$P_{BL}$		3.72		Watts	6
Life Time		10000	-		Hrs	7

Note)The design of the inverter must have specifications for the lamp in LCD Assembly.

The performance of the Lamp in LCM,for example life time or brightness,is extremely influenced by the characteristics of the DC-AC Inverter.So all the parameters of an inverter should be carefully designed so as not to produce too much leakage current from high-voltage output of the inverter.

When you design or order the inverter,please make sure unwanted lighting caused by the mismatch of the lamp and the inverter(no lighting,flicker,etc) never occurs.When you confirm it,the LCD Assembly should be operated in the same condition as installed in your instrument.

Notes: 1. The specified current and power consumption are under the  $V_{cc} = 3.3V$  , 25°C,  $f_v = 60Hz$  condition. Power supply input current and Typ.Power consumption is measured while 64 gray pattern is displayed. The max. power consumption is measured while full black pattern is displayed.

2. The variance of the voltage is  $\pm 10\%$ .

3. The voltage above  $V_s$  should be applied to the lamps for more than 1second for start-up.

Otherwise, the lamps may not be turned on.

4. The output of the inverter must have symmetrical(negative and positive) voltage waveform and symmetrical current waveform.(Unsymmetrical ratio is less than 10%)

Please do not use the inverter which has unsymmetrical voltage and unsymmetrical current and spike wave.

Lamp frequency may produce interference with horizontal synchronous frequency and as a result this may cause beat on the display. Therefore lamp frequency shall be as away as possible from the horizontal synchronous frequency and from its harmonics in order to prevent interference.

5.Let' s define the brightness of the lamp after being lighted for 5 minutes as 100%.

$T_s$  is the time required for the brightness of the center of the lamp to be not less than 95%.

6. The lamp power consumption shown above does not include loss of external inverter.

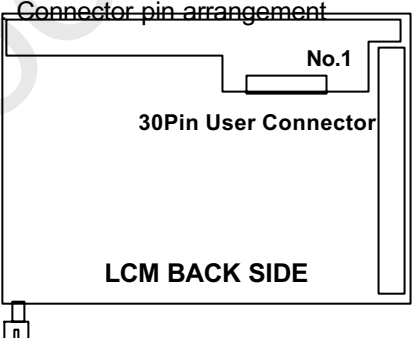
7. The life time is determined as the time at which brightness of lamp is 50% compared to that of initial value at the typical lamp current on condition of continuous operating at  $25\pm 2^\circ C$ .

**Product Specification****2-2. Interface Connections**

Interface IC must be LVDS compatible, part No. THC63LVDF83A made by Thine, or use the compatible interface ICs made by either TI or NS. This LCD employs two interface connections, a 30-pin connector is used for the module electronics and the other connector is used for the integral backlight system.

The electronics interface connector is a model FI-XB30S-HF10 manufactured by JAE. The pin configuration for the connector is shown in the table below.

**Table 2 MODULE CONNECTOR PIN CONFIGURATION (LVDS) [CN1]**

Pin	Symbol	Description	Notes
1	GND	Ground	1. Definition about LVDS signals 1.1 LVDS input terminal pin assignment 0(Even), 1(Odd), 2(Even) ---- ----, 1598(Even), 1599(Odd)
2	Vcc	Supply Voltage(+3.3V)	
3	Vcc	Supply Voltage(+3.3V)	
4	NC	(No Connection)	1.2 The Even LVDS signal must include the timing signal(Hsync., Vsync., DE) (Pin no. 14 and 15)
5	NC	(No Connection)	
6	NC	(No Connection)	
7	NC	(No Connection)	2. Connector 2.1 LCD : FI-XB30S-HF10 (JAE) 2.2 System : FI-X30M
8	RAMP1	Minus Signal of Even Channel 0	
9	RAPP1	Plus Signal of Even Channel 0	
10	GND	Ground	3. Connector pin arrangement 
11	RBMP1	Minus Signal of Even Channel 1	
12	PBPP1	Plus Signal of Even Channel 1	
13	GND	Ground	
14	RCMP1	Minus Signal of Even Channel 2	
15	RCPP1	Plus Signal of Even Channel 2	
16	GND	Ground	
17	RCLKMP1	Minus Signal of Even Clock Channel	
18	RCLKPP1	Plus Signal of Even Clock Channel	
19	GND	Ground	
20	RAMP2	Minus Signal of Odd Channel 0	
21	RAPP2	Plus Signal of Odd Channel 0	
22	GND	Ground	
23	RBMP2	Minus Signal of Odd Channel 1	
24	PBPP2	Plus Signal of Odd Channel 1	
25	GND	Ground	
26	RCMP2	Minus Signal of Odd Channel 2	
27	RCPP2	Plus Signal of Odd Channel 2	
28	GND	Ground	
29	RCLKMP2	Minus Signal of Odd Clock Channel	
30	RCLKPP2	Plus Signal of Odd Clock Channel	

The backlight interface connector is a model BHSR-02VS-1, manufactured by JST. The mating connector part number is SM02B-BHSS-1 or equivalent. The pin configuration for the connector is shown in the table below.

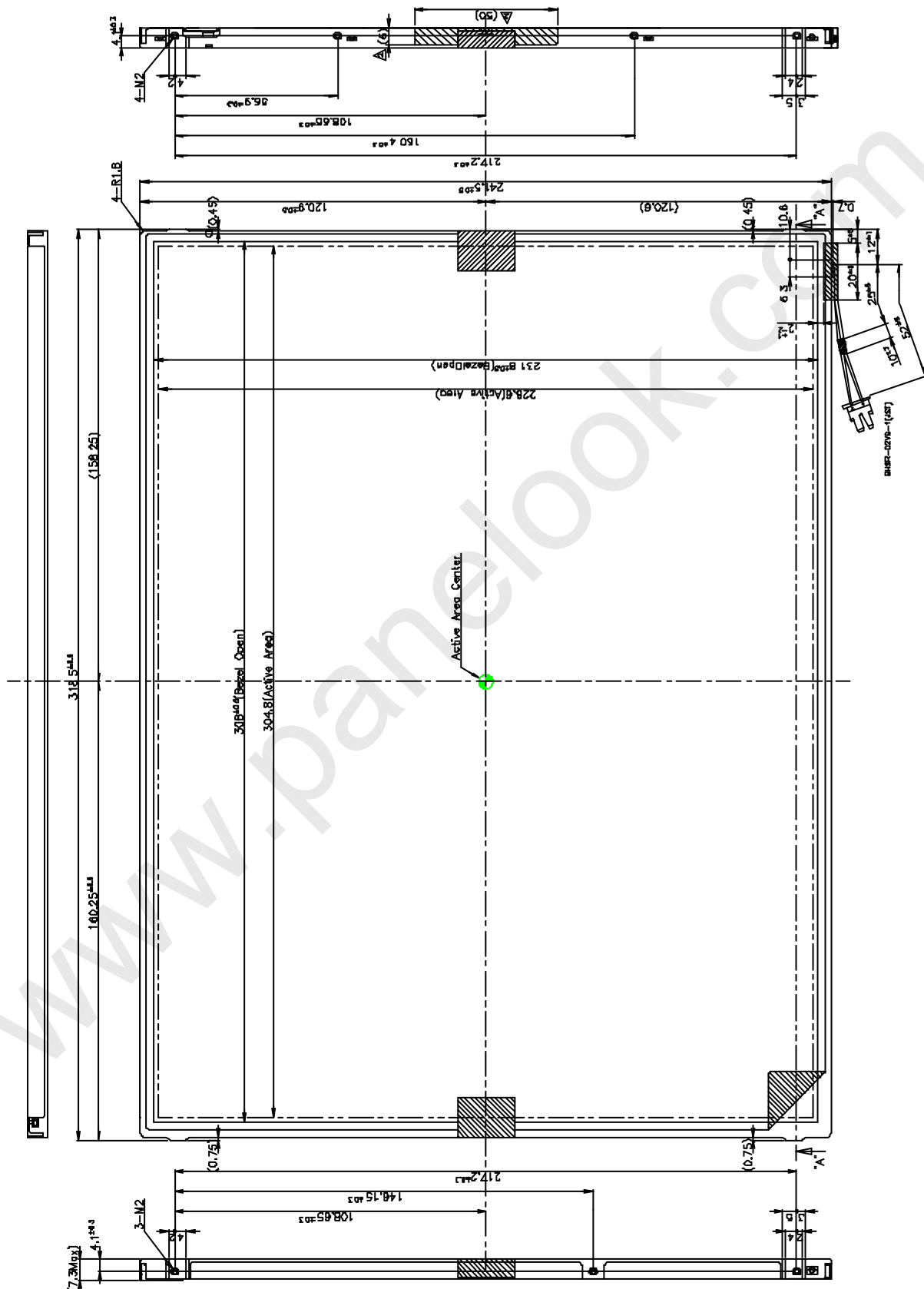
**Table 3 BACKLIGHT CONNECTOR PIN CONFIGURATION [CN2]**

Pin	Symbol	Description	Notes
1	HV	High voltage input	1
2	LV	Low voltage input	

Notes: 1. The high voltage input terminal is colored pink.

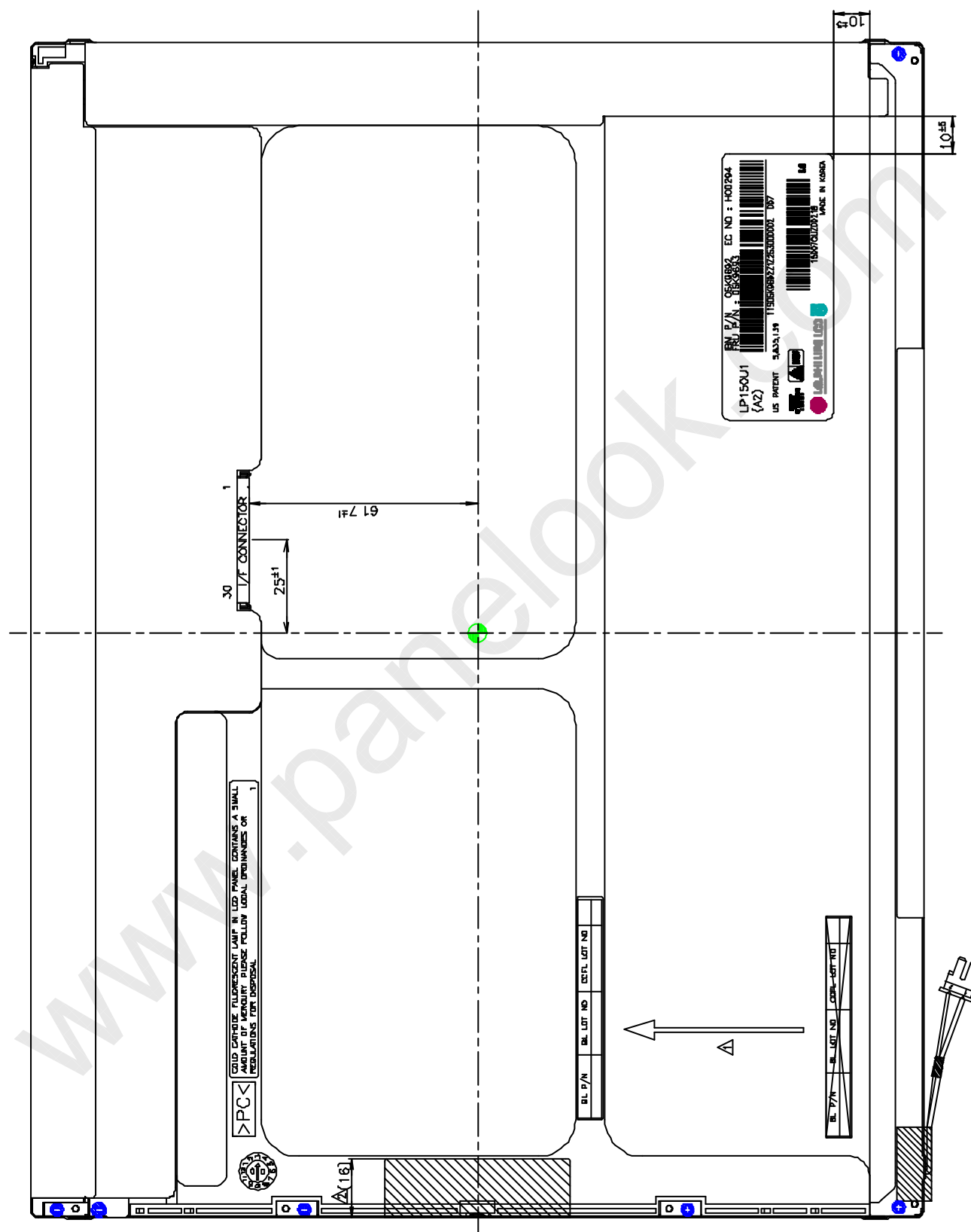
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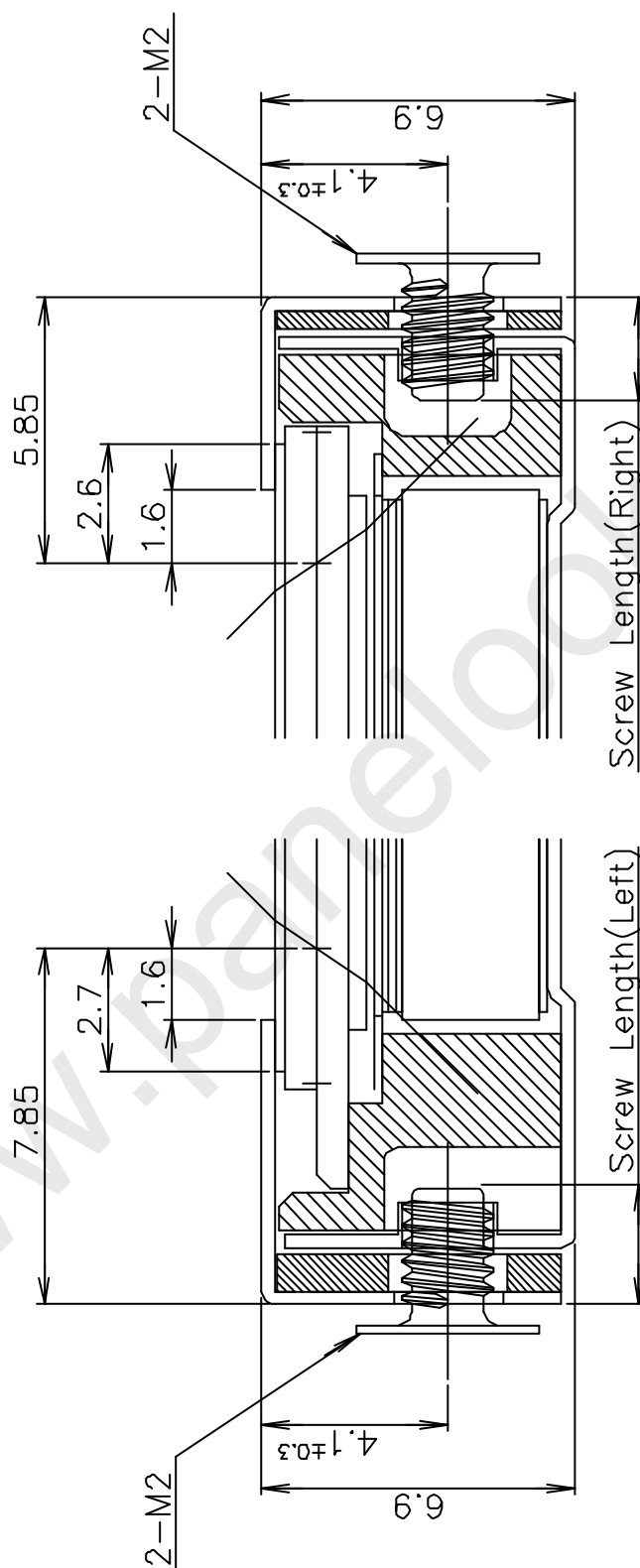
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&lt; REAR VIEW &gt;



**Product Specification**
**<SECTION AA>**


\* Screw Length : Left (Max : 3.2, Min : 2.5)

Right (Max : 2.9, Min : 2.2)

△ \* Screw Torque : ~~Max 2.0kgf cm~~ Max 3.0kgf cm

**LP150U1**  
**Liquid Crystal Display****Product Specification****3.PRECAUTIONS**

The LCD Products listed on this documents are not suitable for use of Military,Industry,Medical etc. system.

If customers intend to use these LCD products for above application, Please contact ours sales people in advance.